

mation is serious, for it affects some factors--such as trends in students' attitudes and motivation, certain characteristics of teachers, and local graduation requirements--that conceivably could have had a substantial impact on test scores.

#### Additional Inferences About the Causes of the Achievement Trends

Because the results of a factor-by-factor analysis are incomplete and leave some of the change in test scores unexplained, many analysts would like to go beyond it. One way to do so would be to extend that analysis to include additional specific factors. This approach, however, is analogous to building a large house from small bricks; given the apparently small contribution of the factors considered here, the list of factors assessed might have to be expanded substantially to obtain a full explanation of the trends. In addition, because of gaps in the data, many factors would remain unasessed, and the explanation would remain correspondingly incomplete.

An alternative approach, noted in Chapter III, is to examine the general patterns apparent in the achievement data for hints about the trends' causes. Two important inferences suggested by this approach are discussed here.

The Contribution of Noneducational Causes. An important inference to be drawn from the broad patterns in the achievement data is that however important the contributions of educational factors, societal factors also probably contributed substantially to the trends in test scores. This inference corroborates the factor-by-factor analysis reported above. Three aspects of the achievement data point to this conclusion:

- o The consistency and near ubiquity of the basic trends;
- o The cohort effect shown by the timing of the end of the decline and the onset of the subsequent upturn; and
- o The parallels in timing between the achievement trends and changes in certain characteristics of American youth.

The strength of this conclusion rests on two judgments: how likely it is that noneducational influences could have produced these particular aspects of the achievement trends, and how difficult it would be to explain them solely in terms of educational factors. Educational factors could have exerted a

powerful influence on achievement trends and still be insufficient to account for these particular patterns.

Numerous societal factors would probably affect many students in a broad variety of settings and thus could contribute to the pervasiveness of trends evident in the data on test scores. Any effects of changes in family configuration accompanying the baby boom and the subsequent baby bust, for example, would have been felt throughout the nation, though not equally in all areas. The effects of changes in the ethnic composition of the school-age population would also be widespread, though with local variations. Some of the less measurable societal factors that have been suggested as causes of the achievement trends might also have affected diverse students in many, highly dissimilar settings. These factors include students' increased sense of alienation and their lessened motivation to achieve.

Regardless of the magnitude of their contribution to the achievement trends, educational factors alone seem far less likely than societal factors to have produced such a striking consistency of trends in diverse settings. The highly decentralized nature of the American educational system--in which decisions about educational policy are made by 50 state education agencies, legislatures, and governors, as well as more than 15,000 local education agencies--would tend to lessen the uniformity of achievement trends attributable to educational practices. Despite this decentralization, similar educational changes sometimes do occur in many jurisdictions, and educational factors therefore cannot be ruled out as possible contributors to pervasive trends in achievement. But it is difficult to imagine educational changes sufficiently ubiquitous, extensive, and uniform in timing to have caused by themselves achievement trends as pervasive as those that have occurred over the past 20 years. The evidence of similar trends in Catholic schools and in Canada makes a purely educational explanation even less likely, because Catholic schools are substantially--and Canadian schools entirely--independent of the governance structures that determine policy in American public schools.

Moreover, most educational changes would probably not produce the observed similarity in test score trends among subject areas, types of students, and types of schools. For example, some people have pointed to changes in reading or mathematics curricula as having contributed to the achievement decline, and there is evidence that such changes might indeed have played a role. The principal effects of such changes would presumably be found in those specific subject areas, however, and therefore they would be insufficient to explain the comparable--indeed, in some instances, larger--declines in other subject areas, such as social studies and natural

sciences. Similarly, the effects of many of the educational changes suggested as causes of the decline would have been largely limited to certain groups of students--for example, those in specific grades or particular tracks. In contrast, various societal trends, such as demographic changes and shifts in students' attitudes toward schooling, would be quite likely to affect performance more generally.

The cohort pattern shown by the timing of the end of the decline also suggests the importance of noneducational factors. In order to account for this pattern, some of the major influences on test scores must have been experienced by a very large number of children in diverse settings no later than the age of nine, and this set of factors must have acted on cohorts of children, not on students of various ages in school in any one year. Some societal factors, such as changes in ethnic composition, exposure to certain environmental toxins, and perhaps certain aspects of family composition, would fit this pattern.

In contrast, a cohort pattern--and, in particular, the cohort pattern shown by test scores in recent years--is more difficult to explain solely in terms of educational changes. Although several of the commonly cited educational factors might have contributed to the cohort pattern, they appear insufficient, even as a group, to explain it. For example, educational changes at the high school level, such as trends in the tracking of students into academic and nonacademic programs, could have contributed to the cohort pattern by delaying the onset of the upturn in the higher grades, but they cannot explain the existence of the cohort pattern in the upper elementary and junior high school grades. 5/

Finally, the rough parallels in timing between trends in test scores and changes in a variety of other characteristics of American youth suggest that noneducational causes were significant. The suicide, homicide, and arrest rates among white male adolescents and young adults, for example, soared during the years of the test score decline, and the rates among females increased appreciably; more recently those rates have stabilized or declined. The rate of births to unmarried white adolescents also climbed sharply

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5. Educational changes could have created the specific cohort pattern shown by test scores if they were implemented in all grades above the third, were undertaken first in the early grades and successively later in higher grades, and were undertaken in the late elementary grades fully a decade before the changes in senior high school test scores. Few of the educational factors suggested as possible causes of the achievement trends, however, meet any of these criteria, let alone all three. Educational changes implemented only in the lower grades could also have produced the cohort effect, but only if two conditions were met: if those changes were broad enough to affect achievement in most subject areas, and if their effects were lasting.

during the period of declining test scores.<sup>6/</sup> The societal and cultural shifts underlying trends of this sort might have contributed to a deterioration of test scores as well.

The Timing of Educational Causes. To the extent that educational factors account for the achievement trends, one can infer from the timing of the trends which period's policies might be responsible.

Because trends shown by tests administered at the high school level have commanded the greatest attention, many analysts have searched among the policies of the late 1960s and the 1970s, when scores in the higher grades were falling, for educational practices that might have had deleterious effects on achievement. Similarly, in searching for causes of the upturn in scores, some analysts have looked at policies first implemented in the very late 1970s and 1980s, when scores began rising in the higher grades.

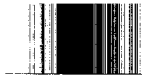
This view is partly correct; for example, certain educational practices of the late 1960s and the 1970s, such as changes in mathematics texts and a watering down of senior high school course content, could have contributed to the decline. But such a view probably obscures some of the important determinants of the trends. It appears just as reasonable to look to that period for policies that might have contributed to rising test scores as to look there for deleterious influences.

Three factors point to this conclusion: the cumulative nature of achievement, the long duration of schooling, and the cohort pattern shown by test scores in recent years. The cohorts that began their schooling in the late 1960s and 1970s have produced unrelenting gains in test scores, and the policies in effect during their early years of schooling might have contributed to that improvement. Because the gains produced by these cohorts were evident very early in their school careers--roughly, by the fourth grade--it is even more reasonable to search among their early educational experiences for contributing factors. In view of these considerations, assuming that policies were detrimental merely because they coincided with trends in senior high school test scores appears unwarranted and misleading.

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6. Edward A. Wynne and Mary Hess, "Long-Term Trends in Youth Conduct and the Revival of Traditional Value Patterns," *Educational Evaluation and Policy Analysis*, vol. 8, no. 3 (Fall 1986), pp. 294-308. In contrast, the rate of births to unmarried black adolescents fell, though erratically, during that period. See National Center for Health Statistics, *Monthly Vital Statistics Report*, vol. 34, no. 6, Supplement (September 20, 1985), Table 18.

The trends in test scores of minority students further suggest a more complex and cautious appraisal of the policies of the recent past. The relative gains of black students, for example, began at least as early as the cohorts that entered school in the early 1960s and were apparent even at the senior high level by the middle of the 1970s. Moreover, absolute gains in scores appeared earlier among black students than among their nonminority peers. If educational factors caused those trends, those factors might have coexisted with other practices that were depressing the test scores of certain nonminority students.



## CHAPTER V

# IMPLICATIONS

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The continuing debate about the quality of public education in the United States, and the accompanying rush of educational policy initiatives throughout the nation, have heightened the importance of understanding recent trends in test scores. Many of these initiatives have reflected a concern that students' achievement is inadequate, or have been intended as a response to recent trends in achievement.

When the current debate and "reform movement" got under way early in this decade, much less was known about recent trends in test scores and their possible causes. The more comprehensive overview of the trends and their causes provided in this paper and in the previous companion study offer a basis for reexamining earlier assumptions and conclusions as educational policy continues to evolve.

This chapter discusses some of the implications of the recent achievement trends and their causes. It is limited, however, to issues addressed in this paper and in the earlier CBO study. Many equally important issues about educational tests and policy are therefore omitted. For example, the use of fixed cut-off scores on minimum-competency tests as a criterion for high school graduation--a common component of recent educational innovations--has generated considerable research and debate. That controversy is not addressed here because the analyses in these two papers offer little clarification of the issues involved. Similarly, the issue of possible bias in the testing of certain ethnic minorities is not discussed. Despite its great importance, that question is neither critical to understanding the relative trends among ethnic groups discussed here nor illuminated by this analysis.

## ASSESSING EDUCATIONAL ACHIEVEMENT

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Although many of the basic questions about trends in educational achievement have been answered, others cannot be answered with available data, or can be answered only by relying on data with serious shortcomings. For example, representative data about the performance of high-achieving college-bound students are meager, leading many analysts to rely instead on unrepresentative, and in many respects misleading, data from college ad-

missions tests. Data about differences in trends among regions are limited and inconsistent, and information about the achievement of students in private schools is extremely scarce.

Improved data from educational achievement tests would therefore clearly be helpful, particularly if test scores continue to serve as a primary rationale for changes in educational policy. If additional data are to be created, the federal government might take responsibility for providing them, and some prominent recent proposals--for example, the Alexander-James report recently published by the Department of Education--have called for expanding federal activities in this area.<sup>1/</sup> The federal role in providing educational statistics is long-standing and largely noncontroversial, and few other organizations have the ability to create data that are nationally representative and consistent over time. On the other hand, tight fiscal constraints would make any increase in outlays difficult.

The findings of this study, however, make a strong case against creating a single "national achievement test" for this purpose. They show clearly that a variety of measures are often needed to reach reasonably certain conclusions about student achievement. Only by comparing several tests can the analyst distinguish results that are consistent enough to provide a firm basis for policy from those that are merely idiosyncrasies of individual tests.

The results of this analysis thus challenge a widespread confidence in the adequacy of individual tests as indices of achievement. Many analysts have relied on one or a few tests--most often, the National Assessment of Educational Progress (NAEP) or the Scholastic Aptitude Test (SAT)--to gauge achievement. Certain proposals to improve data on student achievement--for example, the Alexander-James report, which proposed a major expansion of the NAEP--could further increase the tendency to rely on a single test. Some recent proposals would even eliminate other, independent sources of data by combining them with the NAEP.

The risk of being misinformed by the results of a single test is appreciable, and it is often impossible to foresee when a single test will be misleading. There are certainly many cases in which numerous tests point to similar conclusions, and in such instances a single, high-quality test would be sufficient. But fundamental inconsistencies in results appear relatively often and affect even tests of high quality, such as the National Assessment.

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1. Lamar Alexander, H. T. James, and others. *The Nation's Report Card: Improving the Assessment of Student Achievement* (Washington, D.C.: Office of Educational Research and Improvement, 1987).



Moreover, the inconsistencies affect even very basic conclusions about trends in achievement--for example, whether trends were more favorable in certain subject areas. Perhaps most important, because some of the significant inconsistencies in the results of current tests were unexpected and remain unexplained, future users of test scores will not always be able to predict when the results of a single test should be accepted with confidence.

Efforts to improve measures of achievement might lessen this problem somewhat but cannot be expected to eliminate it. Inconsistencies in results are probably an inevitable consequence of the incompleteness of any test as a proxy for achievement rather than a sign of remediable flaws in particular tests. Indeed, because some of the important inconsistencies are unexplained, it is not yet clear how tests should be improved to lessen the frequency of these inconsistencies.

Even if it were feasible to eliminate disparities among tests, it would not always be desirable, because those discrepancies can themselves provide important information. Tests often emphasize different skills and knowledge, and disparities in their results can therefore reflect significant differences in students' mastery of various aspects of a subject area.

Appraisals of student achievement thus ideally should be based on a number of diverse measures, both to weed out the misleading, idiosyncratic results of individual tests and to capitalize on meaningful variations in results. This approach, however, imposes difficult trade-offs. The costs of maintaining and improving several tests, for example, would probably limit the improvements made to any one test. Precisely what the compromise should be is open to debate, but some current proposals lean further in the direction of relying on a single test than available data justify.

For certain purposes, it would be important, though costly, to collect data on relevant educational and noneducational factors along with the data from additional educational tests. As noted earlier, the meaning of changes in test scores can depend on the factors that caused them. Collecting data on factors such as dropout rates and demographic changes therefore can be critical.

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## EVALUATING EDUCATIONAL POLICIES

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Much of the current interest in aggregate test scores stems from a desire to determine the success or failure of educational policies. Although aggre-



gate test score data can be useful in this respect, the link between educational policies and aggregate test scores is often far weaker and less straightforward than many observers believe. Data that are adequate as a measure of students' achievement do not always provide a sound basis for evaluating policies.

Simple aggregate trends in test scores, taken alone, are an insufficient basis for evaluating new educational policies. Other factors can markedly influence achievement trends, sometimes more substantially than the specific educational policies at issue, and could even obscure their effects entirely. Beneficial policies, for example, could even be accompanied by falling average test scores. Thus, to appraise new initiatives with confidence, one needs to know how trends are being deflected from the course they would have followed in the absence of those policies, not merely whether scores are rising or falling.

In many instances, assessment of new initiatives will also require data that link test scores to the specific educational experiences of different students. Such data are sometimes needed to eliminate the confusion caused by other, irrelevant influences on test scores. For example, to show that increased course requirements improved achievement, one would want data that indicated particularly favorable trends among students whose course load was altered as a result; positive trends among students whose course load already far exceeded the new requirements would presumably reflect something else. In addition, data linking scores to specific educational experiences are needed to identify differences in the responses of various groups, such as high- and low-achieving students, to a given change in policy.

If simple trends in aggregate test scores are used alone to evaluate new policy initiatives in the near future, they will often overestimate the initiatives' effectiveness. Indeed, they could even suggest a positive effect when initiatives are actually ineffective or moderately harmful. One reason is that the ongoing rise in test scores antedates many of the current initiatives and might have continued in their absence. Even if incoming cohorts of students would not have continued to produce increasing scores, average scores in the higher grades might well have continued rising, since the cohorts that will be entering the higher grades over the coming years have already produced gains in the lower grades. In those instances in which scores would have continued rising even in the absence of policy change, the simple continuation of the rise in scores offers no evidence that an initiative has been effective; rather, success would be indicated only if the rise in scores were augmented.

The effectiveness of programs initiated by states or localities could also be substantially overestimated if the general, nationwide rise in scores is not distinguished from the impact of those specific programs. This error is particularly likely when average scores in a given jurisdiction are compared with national norms that are only infrequently revised (as is the case with most commercial standardized achievement tests). In those instances, when scores are rising nationwide, the typical district or state will see its scores rise relative to the national average simply because the national standard is increasingly out of date and thus progressively lower than it should be.

The effectiveness of some initiatives could also be overestimated because of the tendency by some teachers to "teach to the test"--that is, to tailor their instruction to meet the demands of tests. Both proponents and opponents of the current wave of increased testing agree that greater teaching to the test will result from it.<sup>2/</sup> Regardless of whether this response benefits or harms instruction, it can seriously distort trends in average scores when the instructional goals are much broader than the material tested, which is often the case. In such situations, students' overall achievement can only be gauged fully by using additional measures that capture aspects of the curriculum that are not stressed in the test toward which teachers are directing their instruction.

In other instances, however, simple aggregate trends in test scores will bias evaluations downward, thereby understating or even obscuring the impact of successful educational initiatives. This can happen, for example, in areas where demographic changes in the school-age population are especially rapid. The share of the school-age population comprising historically low-achieving groups--certain minority groups and students with limited (or no) proficiency in English--is rising, as a result of both immigration and differences in fertility among ethnic groups. While these trends are gradual in the nation as a whole, they are much more pronounced in certain jurisdictions, and scores in these areas are likely to be deflected downward from whatever course they would have followed in the absence of these demographic changes.

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2. See, for example, W. James Popham, Keith L. Cruse, Stuart C. Rankin, Paul D. Sandifer, and Paul L. Williams, "Measurement-Driven Instruction: It's on the Road," *Phi Delta Kappan*, vol. 66 (May 1985), pp. 628-634; and R. M. Jaeger, "The Final Hurdle: Minimum Competency Achievement Testing," in G. R. Austin and H. Garber, eds., *The Rise and Fall of National Test Scores* (New York: Academic Press, 1982), pp. 223-246.

Simple trends in test scores will also underestimate the success of new policies if those initiatives are accompanied by certain changes in the selection of students for testing. As explained earlier, selection changes can substantially--and deceptively--alter average test scores, and some educational initiatives could depress scores by altering selection even while improving achievement. The most obvious instance would be initiatives that lowered the dropout rate. Because students who drop out score on average below others, their retention in school could depress average scores or attenuate an ongoing rise, even if their own scores rose as a result of remaining in school. Ironically, the negative effect on test scores--and the resulting underestimate of the program's effectiveness in raising achievement--would be proportional to the programs' success in lowering the dropout rate. Similar distortions could also arise in other ways--for example, if a new program reduced the frequency of unnecessary assignments to special education programs and thereby retained additional low-scoring students in the group routinely tested. 3/

#### IMPROVING EDUCATIONAL ACHIEVEMENT

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Over the last decade, trends in test scores and views about their causes have provided a basis for formulating new educational policies and for presuming their effectiveness. Many people have assumed that a few key factors responsible for much of the decline of the 1960s and 1970s could be identified, and that simply reversing those variables would bring about a similarly dramatic improvement in scores.

This study, however, offers scant encouragement to those who would search among the causes of the recent trends for a few key factors that might cause major improvements in achievement. Although educational factors of that potency might exist, the analysis of past trends reported here did not identify them. On the contrary, if the evidence about the recent past is to serve as a guide, it suggests that modest expectations about the impact of individual educational changes are appropriate. The individual effects of the educational factors that contributed to the achievement trends of the past two decades were small compared with the total change in average scores. Indeed, the substantial contribution of noneducational causes to the recent trends indicates that the total effect of all educational causes combined--including those not assessed in this

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3. By the same token, the apparent effectiveness of policies could be exaggerated by manipulating selection to exclude lower-scoring students from the group routinely tested.

study--fell considerably short of the total change in scores. Thus, to bring about comparably large and pervasive improvements in scores in the future would require a significantly more potent mix of educational changes--including a greater number of factors, more powerful factors, or more drastic changes in certain factors--than was involved in the trends of the past two decades.

The results of this study therefore suggest searching broadly for factors that may improve achievement. Restricting new initiatives to factors that can be linked to past trends could be counterproductive, not only because the impact of those factors would often be smaller than hoped, but also because other factors with equal or greater potential might be ignored. For example, among the factors whose contributions to past trends cannot be gauged because data are inadequate are some--such as students' attitudes and motivation, demands for writing in the classroom, and local graduation requirements--that might have a major impact on students' learning. Even certain of the factors that apparently did not contribute to recent trends--specifically, those that are temporally inconsistent with the trends but that can affect achievement more generally--might nonetheless prove important in the future. For example, the finding that state graduation standards apparently did not contribute to the latter half of the achievement decline does not imply that increases in those requirements will prove ineffective later. The finding that such factors did not contribute to the recent achievement trends merely removes one basis for presuming their effectiveness.

Indeed, the results of this analysis suggest that the effectiveness of the current wave of initiatives should not be presumed on the basis of assumptions about what caused past trends. In many ways, the initiatives are more appropriately seen as an experiment than as a clear-cut response to the trends of the past two decades, and discerning the effects of the initiatives--both beneficial and detrimental--will require careful evaluation.

Even though analysis of past trends does not point to the few key factors that many analysts have wanted to find, it can be useful in focusing new initiatives. For example, the abundant instances in which many students are failing to master knowledge and skills that most people would consider fundamental provide ample suggestions of areas in which instruction needs strengthening. These weaknesses are apparent in diverse subject areas, ranging from knowledge about American government to the ability to apply fundamental mathematics to problems of everyday life.

To successfully counter some of the most troubling aspects of recent data on test scores, initiatives would have to focus on higher-order skills. The term "higher-order" can be used in various ways, but here it refers to skills--such as inferential comprehension in reading, problem-solving, and other applications in mathematics--that entail substantial reasoning and cannot be learned by rote.

While higher-order skills are clearly a more significant aspect of achievement in the higher grades and in the particularly complex material that the highest-achieving students are expected to master, they are also important even in the case of some rudimentary material. Many skills that are "basic"--in the sense of being simple, fundamental skills that all students are expected to master--are nonetheless "higher order" in that they entail reasoning, problem-solving, and so on. Examples include the ability to solve simple word problems involving percentages and the application of arithmetic algorithms to such problems as comprehending utility bills. Proficiency in writing, which many would consider a basic skill--it is one of the "three Rs"--might also fall into this category, for it too involves cognitive skills more complex than the rote learning of facts and algorithms.

Indeed, despite the particularly serious problems in higher-order skills and the greater decline in the higher grades, initiatives that ignore the lower grades--and some have--would miss some of the most important problems revealed by the achievement data. Many of the most troubling deficiencies, including those involving higher-order skills, appear in material taught in the elementary and junior high grades. If the smaller upturn to date in the higher grades is misunderstood as being a fundamentally slower rate of improvement in those grades, it might be seen as a reason to shift emphasis further toward the secondary level despite the existence of these problems in the elementary grades. The smaller rise in scores in the higher grades, however, now appears to be largely an artifact of the smaller number of improving cohorts that have reached the higher grades and not a sign of less rapid improvement.

Ideally, then, educational changes must tread a thin line, strengthening rudimentary skills in many areas without allowing an overemphasis on basic skills that would crowd out instruction in higher-order skills. While striking this balance would be important in any case, the serious erosion of higher-order skills in the recent past make it all the more so. Precisely where that line lies is a matter of judgment, but many observers feel that certain curriculum changes during the past decade and a half have overemphasized "basics." An expert panel convened to assess the implications of the National Assessments of mathematics, for example, argued that a back-to-

basics orientation--specifically, emphasis on computation, facts, and definitions at the expense of problem-solving--narrowed the mathematics curriculum and thus contributed to the particularly severe declines observed in higher-order skills in mathematics in the 1970s.<sup>4/</sup> A current tendency to refer to even higher-level curriculum requirements as "basic"--for example, the labeling by the National Commission on Educational Excellence of high school mathematics (including algebra, geometry, and elementary statistics) as one of the "New Basics"--could inadvertently cloud this critical issue.

Recent data also suggest the importance of focusing on the education of certain traditionally lower-scoring groups, both because their average achievement remains disturbingly low and because of the promising gains some groups, such as black and Hispanic students, have recently made. Simply assuming that educational initiatives directed toward the student body as a whole will have the intended effects with low-achieving students as well risks eroding their recent gains. These gains remain largely unexplained, because the commonly cited explanations--desegregation and federally funded compensatory education--can account for only a moderate share of the improvement. Until some of the other factors that helped bring about these gains have been identified, there is a substantial risk that policies contributing to the gains might be inadvertently weakened or abandoned as a side effect of more general efforts to improve education. Careful monitoring of the effects of policy initiatives on the achievement of these specific groups of students are needed, and new policies might require alteration, if these gains are to be augmented.

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4. National Assessment of Educational Progress, *Trends in Mathematical Achievement, 1973-78* (Denver: NAEP/Education Commission of the States, August 1979), p. 25.





## APPENDIX

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### THE EFFECTS OF SPECIFIC FACTORS

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### ON ACHIEVEMENT TRENDS

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This appendix summarizes the evidence pertaining to the contributions of over two dozen specific factors to test score trends. Societal, educational, and selection factors are discussed in separate sections.

#### SOCIETAL FACTORS

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The societal factors considered here are extremely diverse, since this category is a residual that includes any factors that are neither educational nor selection variables. The category includes changes in the ethnic composition of the school-age population, various trends in household and family composition, students' attitudes and behavior, and environmental factors.

##### Changes in the Ethnic Composition of the Entire Cohort

The percentage of minority students in the school-age cohort has been growing, and since the groups accounting for much of that growth have, on average, substantially lower achievement scores than do nonminority students, this shift contributed to the achievement decline and impeded the subsequent upturn. These changes in ethnic composition have been gradual and slight, however, and their effects on recent achievement trends have been correspondingly small. 1/

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1. The term "ethnicity" as used here encompasses some distinctions - - such as that between blacks and whites - - that are often popularly termed racial. The ethnic categories used here are based on, but differ substantially from, those used by the Bureau of the Census. Specifically:
    - o "Black" refers to all individuals who are so identified in the Current Population Survey by the respondent in the household, except for those who also identify themselves as Hispanic.
    - o "Hispanic" refers to all individuals who are identified as being of Hispanic origin or descent, regardless of race. The vast majority of Hispanics are also identified as white.
    - o "Nonminority" refers to those who are neither black nor Hispanic, as defined above, and who do not identify themselves as members of other minorities (such as Native Americans or Asians).

Between the 1971 and 1979 school years (from the first year in which comparable data were available until the approximate end of the decline in achievement among high school seniors), the minority share of the total school-age population (ages 6 through 17) increased from 21 percent to 25 percent.<sup>2/</sup> Hispanic students accounted for roughly half of the total increase in the minority share, black students for about 30 percent, and other minority students (mostly Asians) for the remaining fifth. (The percentages among senior-high students were similar, although the minority proportion was a bit lower in that age group.)

The impact of this shift would vary from one test to another, because disparities in scores among ethnic groups differ markedly among subject areas and tests. For example, Asian students taking the SAT score above the nonminority average on the mathematics scale but below the nonminority average on the verbal scale.<sup>3/</sup> Moreover, the disparity between minority groups and nonminority students can change as the minority groups grow--especially when immigration is a major source of the increase, for the new members of the group can differ substantially from previous cohorts. Current Asian immigrants, for example, represent a different mix of ethnicities than did the Asian students of the recent past and should not be expected to show the same achievement patterns.<sup>4/</sup>

In the nation as a whole, changes in the ethnic composition of the school-age population between 1971 and 1979 probably depressed the score of the median student by roughly one percentile--that is, from the 50th to the 49th percentile--or even less, depending on the test. By comparison, during the same period, drops of five to nine percentiles were observed on some tests administered to high school seniors, and the SAT-Verbal dropped by 11 percentiles.

#### Single-Parent Households

The proportion of children living in single-parent households has grown markedly over the past 25 years. Whatever the effect on the achievement

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2. Congressional Budget Office tabulations of the March Current Population Survey, 1972 through 1980.
  3. College Entrance Examination Board, "College Board Data Show Class of '85 Doing Better on SAT, Other Measures of Educational Achievement" (New York: The College Board, press release, 1985).
  4. See Robert W. Gardner, Bryant Robey, and Peter C. Smith, "Asian Americans: Growth, Changes, and Diversity," *Population Bulletin*, vol. 40, no. 4 (October 1985), Tables 1 and 9.